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- Published:**
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
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- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: MULTIPLEX POLYMER LIGATION

(57) **Abstract:** The invention concerns a multiplex polymer ligation method involving water-soluble polymeric protecting groups, compositions and methods of use. The method involves synthesis of a first compound bearing one or more water-soluble polymeric protecting groups followed by replacing one or more of the water-soluble protecting groups with a chemical adduct of interest. Multiple different compounds derived from the first compound can be readily prepared by splitting the first compound into first and second reaction systems, followed by replacing one or more of the water-soluble polymeric protecting groups of the first reaction system with a first chemical adduct, and replacing one or more of the water-soluble polymeric protecting groups of the second reaction system with a second chemical adduct of interest, where the first and second chemical adducts are different. Also provided are kits useful for carrying out the multiplex polymer ligation methods of the invention.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/41459

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C12Q 1/00; G01N 33/53; C07K 14/00
US CL : 435/ 4, 6, 7.1; 530/ 324, 350

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 435/ 4, 6, 7.1; 530/ 324, 350

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 5,616,698 A (KREPINSKY et al.) 1 April 1997, see entire patent, especially col. 2, line 35-top of col. 4; col. 5; col. 19-30.	1-17, 26 ----- 18
X -- Y	ROSE et al., "Stepwise Solid-Phase Syntheses Of Polyamide Linkers", JACS Vol. 121, No. 30 (1999), pages 7034-7038, see entire article.	1-17, 19-24 and 26 ----- 18, 25
Y	CANNE et al., "Solid Phase Protein Synthesis By Chemical Ligation Of Unprotected Peptide Segments In Aqueous Solution", The 1997 Peptide Symposium, Nashville, Tennessee, June 14-19 1997, pages 1-6, see entire article.	1-17, 19-24, 26
Y	XU et al., "Chemical Ligation Of Folded Recombinant Proteins: Segmental Isotopic Labeling Of Domains For NMR Studies", PNAS USA, Vol. 96 (1/99) pages 388-393, see entire article.	18 and 25
A	DAWSON et al., "Synthesis Of Proteins By Native Chemical Ligation", Science, Vol. 266 (Nov. 4, 1994) pages 776-779, see entire article.	1-26

☒ Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

22 November 2004 (22.11.2004)

Date of mailing of the international search report

21 JAN 2005

Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/41459

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-17, drawn to method of producing chemically modified compounds.

Group II, claim(s) 18, drawn to method of producing a library of chemically-modified compounds.

Group III, claim(s) 19-24, drawn to method of producing chemically modified ligated polypeptides.

Group IV, claim(s) 25, drawn to method of producing a library of chemically modified ligated polypeptides.

Group V, claim(s) 26, drawn to a kit.

Continuation of B. FIELDS SEARCHED Item 3:

West: PGPB, USPT, USOC, EPAB, JPAB, DWPI, TDBD;

STN: CAPLUS